

Notice of Allowability

Application No.

10/651,115

Examiner

Zachary M. Pape

Applicant(s)

MEASE ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the voicemail left on 11/20/2007.
2. ☒ The allowed claim(s) is/are 1-4,6,9-18 and 20-23.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>11/20/2007</u> |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

The following detailed action is in response to the voicemail left on 11/20/2007.

Claim Objections

The objection to the claims has been withdrawn in view of the amendments thereto.

Specification

The objection to the specification has been withdrawn in view of the Applicants' remarks thereto.

Drawings

The objection to the drawings has been withdrawn in view of the Applicants' remarks thereto.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a voicemail by Stephen Weed (45,202) on 11/16/2007.

The application has been amended as follows:

1. A heat sink configured to support an edge of a circuit card, said heat sink comprising: a thermally conductive base; a plurality of thermally conductive heat dissipating fins extending perpendicularly from said base, each fin having a length extending parallel to the base; ~~one~~two or more card supporting recesses, each card supporting recess at least partially defined by adjacent parallel faces of two adjacent fins extending perpendicularly from said base, the card supporting recesses defined in part by surfaces parallel to the base extending along the length of the fins, the card supporting recesses having a depth smaller than the height of said fins, and the adjacent parallel faces and the surface parallel to the base of each card supporting recess support the edge of a circuit card; at most three base recesses between adjacent card supporting recesses, each base recess at least partially defined by adjacent parallel faces of two adjacent fins extending perpendicularly from said base, the base recesses having a depth at least substantially equal to the height of said fins; and a face of the base disposed opposite said fins, said base being configured to be mounted with said face abutting a heat-generating component.

3. The heat sink of claim 1, wherein said ~~one~~two or more card supporting recesses are further configured to support the edge of the circuit card in sliding association with said heat sink.

4. The heat sink of claim 3 wherein said card supporting recesses is a slot configured to guide the edge of the circuit card during sliding movement of the circuit card.

6. The heat sink of claim 1 wherein each of said ~~one~~two or more of said card supporting recesses ~~is~~are further defined by said base.

7. (Canceled)

10. A method for supporting a circuit card in a computer system, said method comprising the steps of: affixing in a computer system a heat sink having at two or more card supporting recesses and at most three base recesses between adjacent card supporting recesses, each card supporting recess configured to receive an edge of a circuit card such that the card supporting recess orients the circuit card to enable mating the circuit card with a connector, the card supporting recess at least partially defined by at least one of a plurality of thermally conductive heat dissipating fins, and a surface extending parallel to a base of the heat sink, the card supporting recess having a depth smaller than the height of said fins, each base recess at least partially defined by adjacent parallel faces of two adjacent conductive heat dissipating fins extending perpendicularly from said base, the base recesses having a depth at least substantially equal to the height of said fins; abutting a face of the base disposed opposite the fins against a heat-generating component; and positioning the edge of the circuit card in one of the card supporting recesses by advancing the card in the one card supporting recess in a direction parallel to the base such that the edge of the circuit card is supported by the plurality of thermally conductive heat dissipating fins and the surface extending parallel to the base that at least partially define the one of the card supporting recesses.

11. The method of claim 10, wherein said positioning step comprises sliding the circuit card in the one of the card supporting recesses~~recess~~.

13. The method of claim 12 wherein the heat-generating component is mounted on a circuit board, and said affixing step comprises affixing the heat sink with the one of the card supporting recesses~~recess~~ disposed opposite the heat-generating component.

14. The method of claim 10, wherein the circuit card carries at least one heat generating component, and said positioning step comprises thermally coupling the at least one heat generating component of the circuit card to the heat sink when the circuit card is positioned in the one of the card supporting recesses~~recesses~~.

15. A circuit board assembly comprising: a circuit board; a heat generating component mounted on said circuit board; and a heat sink thermally coupled to said heat generating component, the heat sink having a base abutting the heat generating component and a plurality of fins disposed on a surface of the base opposite the heat-generating component for dissipating heat, the plurality of fins having faces parallel to one another, said parallel faces of the fins defining two or more card supporting recesses and at most three base recesses between adjacent card supporting recesses~~recess~~, each of said card supporting recesses~~recess~~ extending parallel to the base and at least partially defined by at least one of said fins and by a surface parallel to the base extending along a length of the fins, the card supporting recess having a depth smaller than the height of said fins, and the parallel faces of the fins and the surface parallel to the base supporting and guiding an edge of a circuit card, each of said base recesses at least partially defined by adjacent parallel faces of two of said fins extending

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perpendicularly from said base, the base recesses having a depth at least substantially equal to the height of said fins.

16. The circuit board assembly of claim 15 wherein said circuit card comprises an edge portion in sliding association with said card supporting recess.

17. The circuit board assembly of claim 15 further comprising a connector configured for electrically coupling said circuit card to a computer system, said card supporting recess of said heat sink being oriented to guide said circuit card for coupling said connector to said computer system.

18. A heat sink guiding one or more circuit cards and transferring heat, said heat sink comprising: a first surface defining ~~one~~two or more card supporting slots configured to guide an edge of a circuit card and at most three base slots between adjacent card supporting slots; a second surface opposite the first surface, the second surface being configured to abut a heat-generating component; and heat dissipating fins thermally coupled to said first surface, said ~~one~~two or more card supporting slots and said base slots at least partially defined by two adjacent parallel faces of said fins, said ~~one~~two or more card supporting slots and said base slots being defined in part by a portion of said first surface extending parallel to the base, said card supporting slots~~slot~~ having a depth smaller than the height of said fins and said base slots having a depth substantially equal to the height of said fins, and the two adjacent parallel faces of said fins and the portion of said first surface extending parallel to the base of at least one card supporting slot supporting the edge of the circuit card, said heat sink being configured to

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provide a thermal path from the heat-generating component to said fins via said second surface.

21. A method for guiding a circuit board in a computer system, said method comprising: sliding an edge portion of the circuit board along an insertion axis in one of two or more card supporting recesses separated by at most three base recesses, the card supporting recesses a recess defined by adjacent fins of a heat sink of the computer system such that the edge portion of the circuit board is supported by the adjacent fins and a surface extending parallel to ~~the~~ a base of the heat sink defining the one of the two or more card supporting recesses, the insertion axis extending parallel to the base and, the card supporting recesses ~~recess~~ having a depth smaller than the height of the fins of the heat sink and the base recesses having a depth at least substantially equal to the height of the fins of the heat sink; abutting a surface of the heat sink disposed opposite the fins against a heat generating component; and mating the circuit card with a connector.

Allowable Subject Matter

2. Claims 1-4, 6, 9-18, 20-23 are allowed.

The following is an examiner's statement of reasons for allowance:

With respect to claims 1-4, 6, 9-18, 20-23, the allowability resides in the overall structure of the device as recited in independent claims 1, 10, 15, 18, and 21 and at least in part because claims 1, 10, 15, 18, and 21 recite at most three base slots or recesses between adjacent card supporting recesses.

The aforementioned limitations in combination with all remaining limitations of claims 1, 10, 15, 18, and 21 respectively are believed to render said claims 1, 10, 15, 18, and 21 and all claims dependent therefrom (Claims 2-4, 6-9; 11-14, 22; 16-17; 20; and 23 respectively) patentable over the art of record.

While Lo and Hughes either alone or in combination taught all the limitations of the claims as per the official action dated 6/19/2007, both Lo and Hughes fails to teach that there are at most three base slots or recesses between adjacent card supporting recesses.

Additionally Shah (US 6,377,463) teaches a card supporting heat sink with fins extending perpendicularly from a base as well as card supporting recesses (defined at least in part by a surface parallel to the base extending along the length of the fins) but fails to teach or suggest having at most three base slots or recesses between adjacent card supporting recesses.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,226,185; US 6,362,963 both further teach heat sinks with card supporting recesses.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary M. Pape whose telephone number is 571-272-2201. The examiner can normally be reached on Mon. - Thur. (7:00am - 5:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayprakash Gandhi can be reached at 571-272-3740. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Zachary M. Pape

ZMP

BORIS CHERVINSKY
PRIMARY EXAMINER

Boris I. Chervinsky
11/20/17